

JK LAKSHMIPAT UNIVERSITY, JAIPUR

INSTITUTE OF ENGINEERING AND TECHNOLOGY

End Term Examination (Regular/Backlog), April-May 2016

B. Tech (CHEMICAL) Engineering, Semester-IV

Roll No.....

COURSE CODE: FUEL AND COMBUSTION
TECHNOLOGY; (406)

Time: 3 hours

Max. Marks: 100

Instructions to students:

1. Do not write anything other than your roll number on question paper.
2. Assume suitable data wherever required and mention it clearly.
3. Writing appropriate units, nomenclature, and drawing neat sketches/schematics/ flow chart wherever, required are an integral part of the answer.

- Q.1A Objective type multiple choice questions (10 questions @ 1 mark) 10
- i. Fischer-Tropsch process used for
A. formation of liquid fuel B. reduce the size of organic waste
C. metal catalysis process D. none
 - ii. Crude desalting is a process of
a. purifying process b. reduce corrosion and fouling c. Both a & b
d. mixing salting
 - iii. Heavy oil separated by
a. atmospheric vacuum b. vacuum distillation Column c. preheating of crude oil d. none
 - iv. GCV represents for fuel is
a. gross calorific value b. physical property of fuel c. it is equal to net calorific value d. all of the above
 - v. Oleophobic impurities is
A. Sulphur organic compounds B. Ca & Mg salts C. Mud D. none
 - vi. If any fuel which contain more Sulphur percentage so this coal useful for
a. domestic purpose b. industrial purpose c. not useful as fuel
d. all of the above
 - vii. Coal tar pitch is
a. mixture of chemical b. intermediate of chemical products c. both a&b
d. none
 - Viii. In coal liquefaction which method is more effective for obtaining products.
A. direct method B. indirect method C. both a & b D. FT process
 - ix. Syn gas is mixture of
a. CO + H₂ b. CO₂ + H₂ c. CO₂ + H₂O d. all of the above
 - x. Coal gasification method utilized to produce
a. methanol b. ethanol c. propanol d. both a & b



Q.2	Short answer type questions (4 questions @ 2.5 marks)	10
1	Write short note carbonization of coal.	
2	Write short note on bituminous coal	
3	Write short note on flame structure.	
4	Write short note atmospheric distillation.	
Q.3A	Explain the catalytic cracking and its advantage.	05
Q.3B	Discuss the characteristics of a good fuel	05
Q.4A	Discuss the coal preparation and washing.	05
Q.4B	Draw a block diagram of different routes of coal liquefaction.	05
Q.5A	Discuss the premixed flames of fuel.	05
Q.5B	Discuss the producer gas .	05
Q.6A	Draw the flow diagram of tar distillation plant.	05
Q.6B	Explain the diesel cycle in IC engine.	05
	OR	
Q.6B	What are important gaseous fuel? What are the advantages of gaseous fuel over other kind of fuel.	05
Q.7A	Draw the coal gasification process in block diagram.	05
Q.7B	Explain the vacuum distillation process in oil refinery.	05
	OR	
Q.7B	Explain the blast furnace with all chemical reaction appear during process.	05
Q.8A	What is metallurgical coke ? Describe the Otto hoffman method for metallurgical coke.	10
Q.9A	Explain the kinetics of combustion reaction.	10
Q.9B	Derive the equation for adiabatic flame temperature at constant pressure.	10
	OR	
Q.9B	Discuss the fundamental of thermochemistry with suitable example	10